Appendix F – Process to Identify Priority Treatment Areas

Spruce Beetle Epidemic and Aspen Decline Management Response

GIS Optimization & Interdisciplinary Validation, September & October 2015

Purpose

Use GIS to focus and prioritize potential treatment areas within the original, broad SBEADMR opportunity areas. For both commercial and non-commercial treatments, use multiple variables to perform the GIS optimization exercise at the landscape-scale. After refining the original area with GIS to an area approximately 2x the extent of actual proposed treatment acreage, incorporate NFS specialists' working knowledge of the ground to fine-tune and validate the priority treatment areas based on additional operational considerations and forest conditions.

Summary Process

Stakeholders provided input during the development of the Draft EIS and Final EIS regarding potential variables to include in the prioritization exercise. This informed the Forest Service interdisciplinary team's and the Science Team's subsequent work.

The following steps summarize steps detailed below:

- Interdisciplinary team identified criteria for prioritizing variables
- Step 1:
  - Refined initial analysis area to exclude areas with recent treatments that would render near-term treatments moot
- Step 1:
  - Interdisciplinary team and Science Team filtered stakeholder- and staff-identified variables through criteria to select final variables
  - Interdisciplinary team and Science Team agreed on scores and weights for variables
- Step 2:
  - Science Team ran optimization based on the variables, weights, and scores identified
  - Identified score threshold corresponding to 2x proposed treatment acreage and carried forward in next steps
- Step 3: Clustered high-scoring areas to ensure feasibility of treatment
- Step 4:
  - Linked high-scoring clusters to mapped vegetation polygons/stands
  - Interdisciplinary team and additional Forest Service specialists reviewed, validated, and fine-tuned the initial priority treatment areas for operational considerations and on-the-ground conditions in order to create the final priority treatment areas.

Criteria for prioritization variables

- Related to complexity of treatment planning (requires more design features to address, surveys to identify, monitoring to confirm, etc.)

- Cost
- Decent data exists across the planning area
- Relevant at a relatively coarse, landscape-scale
- Relatively static (doesn't rapidly change on a broad scale)

Commercial treatment analysis

Step 1: Determine initial analysis extent

The extent of potential commercial treatments was limited to Engelmann spruce and aspen-dominated forests with suitable timber, outside designated Colorado Roadless and Wilderness, and all Engelmann spruce and aspen-dominated forests (regardless of timber suitability) within ski area permit boundaries in the GMUG (the Alternative 4 commercial area). The maximum extent from the SBEADMR Draft alternatives (Alt 4) was selected as the initial extent for the prioritization exercise, acknowledging that prioritization of the other alternatives would necessarily be included in such maximum extent. From this initial extent of 329,800 acres, past treatments that would eliminate the need for additional commercial treatment over the next 10 years were excluded (***Table 1***), for a final analysis extent of 322,740 acres (***Map 1a***).

Step 2: Identify variables

A number of variables were generated via participatory public process and included in the SBEADMR Draft (Chapter 2, pgs. 43-44) as variables for future consideration at such a time the prioritization exercise occurred. After filtering these variables through the criteria above, as well as staff- and Science Team-identified variables, the interdisciplinary team confirmed 5 variables for the commercial treatment optimization:

- accessibility (distance to existing roads)
- fire risk in the Wildland Urban Interface (WUI)
- drainage density
- lynx use
- Gunnison sage-grouse critical habitat

Variables were scored from 0 to 4 or 0 to -4 (lynx use only), with higher numbers representing values that were more desirable to treat commercially. The total score was a sum of all input variables, weighted as follows: distance to road (0.30), WUI risk (0.30), drainage density (0.15), lynx use (0.15), and Gunnison sage-grouse critical habitat (0.1). (***Step 2a Maps***)

Step 3: Determine input data for variables and derive scores

Each of these variables was represented in a raster with a cell size of 30 m.

Distance to existing roads (approved National Forest System roads) was scored as follows: <1/4 mi from existing road (accessible by skidder) = 4, >1/4 mi and <1 mi from existing road = 2, and > 1 mi from existing road = 0. Area breakdowns for this and all other commercial analysis input scores by forest type can be found in ***Table 3***.

Fire risk in the Wildland Urban Interface (WUI): The extent of the WUI was determined by an existing Forest Service GIS dataset that was created by buffering private land, utilities, communication, and RAWS sites by 1 mile, and developed recreation sites by ¼ mile. Within this extent, fire risk in the WUI was calculated based on *values* and *hazards*. All inputs were scored on a scale from 1 (low) to 4 (very high). Value scores were determined by WUI type (urban interface, utility corridor, communication site, RAWS site, and developed recreation sites), and within the urban interface type scores were based on parcel density within 1 mi (***Table 2***).

Parcel data was obtained from individual counties, except for Hinsdale County where it was unavailable. Government-owned parcels were excluded from the parcel density analysis. In Hinsdale County we used 2010 US census building density data (by census block) to approximate the location and distribution of parcels. We assumed that one building = one parcel, and that all buildings/parcels were within 0.5 miles of a road. Based on these assumptions, we randomly placed the appropriate number of buildings (points) within each census block, and then used Thiessen polygons to construct parcels (polygons) around each building. This approximation does not replicate actual parcels, but does give us a reasonable representation of high parcel density WUI (i.e. near Lake City) and low parcel density WUI (the SW corner of the county). Parcel and census data was supplemented with data on the locations of recreation residences within the GMUG, which were treated as individual parcels when calculating parcel density. Value scores were summed in areas where they overlapped (i.e. a stand that is within 1 mile of a private parcel *and* within a 1 mile utility corridor). Hazard scores were determined by fuel types, slope, and aspect (***Table 2***).

Value and hazard scores were combined in a weighted sum to obtain the final WUI risk score:

$$(0.5) \times Value + (0.3) \times Fuel + (0.1) \times Slope + (0.1) \times Aspect$$

This score was rounded to the nearest integer for input into the optimization model.

We calculated **drainage density** based on National Hydrography Dataset (NHD) flowline data for the GMUG. Flowline segments identified as general, intermittent, perennial, and ephemeral streams or rivers were included in calculations. Man-made drainages (canals, ditches, pipelines) were not included. Drainage density was calculated as the length of all categories of streams and rivers within the surrounding square mile of a cell (within a 0.57 mi radius). We used Jenks natural breaks to categorize raw drainage densities into a 0 – 4 score, where the lowest density category rated as 4 and the highest density rated as 0 (***Table 3***).

Lynx use scores were calculated from a Colorado Parks and Wildlife spatial analysis of lynx habitat use based on 1999-2010 radio collar data. In this analysis, data from individual animals were combined to form a population-level estimate of habitat use, following the general approach of Millspaugh et al. (2006) to create a utilization distribution (UD) surface. Areas with a UD value > 35 (the highest 30%) were defined as "high-use" areas. These high-use areas were scored as -4, and all other areas scored as 0. See ***Table 3.***

Gunnison sage-grouse scores were calculated based on the Gunnison sage-grouse final critical habitat shapefile. Methods and criteria used for the habitat designation can be found in the final critical habitat Federal Register document. Critical habitat (whether vacant or occupied) was scored as a 4 (per CPW's comments advocating active management in such aspen areas), and all other areas were scored as a 0. See ***Table 3.***

Total score

Individual scores for each attribute were combined in a weighted sum to obtain a final score as follows:

$$(0.3) \times WUI\ score + (0.3) \times Distance\ to\ road\ score + (0.15) \times Lynx\ score + (0.15) \times Drainage\ density\ score + (0.10) \times Gunnison\ sage\ grouse\ score = Total\ score$$

Total scores ranged from 0 to 3.1 (***Table 4, Map 3a***).

Step 4: Identify first cut priority treatment areas

We considered all spruce mix and spruce aspen forest with a total score ≥ 1.5 to be higher priority commercial area (132,847 acres). We chose this threshold based on the total acreage at this breakpoint, in order to identify approximately 2x the extent of SBEADMR's proposed commercial treatment totals (60,000 acres). ***Table 5*** shows the percentages of individual attribute scores that were included in this area.

Suitable/commercial aspen mix was excluded from this part of the optimization; absent an existing aspen market, all commercial treatments are expected to be in spruce forests. However, suitable/commercial aspen areas were grouped with the noncommercial clusters of high-scoring aspen, as detailed in the noncommercial analysis steps below. Absent a commercial market for suitable aspen, the Forest still intends to noncommercially treat such where doing so would meet project objectives.

Within the 132,847 acres, we then incorporated additional operational criteria in order to ensure identified areas were clustered closely enough and large enough in size to constitute viable commercial treatments. Criteria included: 1) Treatments must be in a HUC6 subwatershed with ≥ 250 acres of higher-scoring commercial areas; 2) Treatment polygons must have ≥ 250 acres of higher-scoring commercial areas within 1 mile of each other (***Map 4***). The total area at this stage encompassed 128,985 acres.

Note that while the priority treatment clusters were identified based on density of higher-scoring areas, lower-scoring commercial acres existed within such a matrix. These interspersed lower-scoring acres were carried forward in order to maintain operationally contiguous polygons.

Step 5: Validate final priority treatment areas

First cut priority treatment areas were further refined by removing individual polygons less than 5 acres in size. Then we overlaid these areas with photo-interpreted vegetation polygons in the Forest Service FS Vegetation Database. When priority areas intersected a mapped vegetation polygon, the entire polygon was included. Typically, silvicultural prescriptions are written for entire stands during treatment planning (a stand is a mapped vegetation polygon). Similar to above, some lower-scoring areas within such stands/polygons were necessarily included in this step.

Forest Service District personnel then reviewed priority treatment areas for further fine-tuning and validation based upon local knowledge of resource conditions, concerns, and operational considerations.

Forty-four final commercial treatment areas were identified, for a total area of 112,880 acres (***Table 10, Map 5a*****).** These polygons were named for tracking purposes.

Step 6: Clean GIS & Identify Target Vegetation

Due to discrepancies between GIS layers used in the prioritization process, i.e., differences in the Forest Service boundary between layers, the final PTAs were "cleaned" to remove the resulting slivers. Furthermore, insignificant slivers of PTAs that spilled across watershed boundaries were cleaned (less than 1 acre).

After cleaning, the total commercial PTA acres encompassed 112,768 acres.

Non-commercial treatment analysis

Step 1: Determine initial analysis extent

The extent of potential non-commercial target treatments was limited to spruce-aspen and aspen mix forests outside of designated Colorado Roadless and Wilderness, and outside of all forest included in the commercial treatment optimization. From this initial extent of 252,907 acres, recent coppice cuts (1990 and later) were excluded from the potential treatment area, for a total analysis extent of 252,191 acres. (***Map 1b***)

As noted below in Step 3, high-scoring suitable/commercial aspen areas identified by the commercial analysis were incorporated into the noncommercial process at Step 3.[1]

Step 2: Identify variables

A number of variables were generated via participatory public process and included in the SBEADMR Draft (Chapter 2, pgs. 43-44) as variables for future consideration at such a time the prioritization exercise occurred. After filtering these and others through the criteria above, the interdisciplinary team confirmed 3 variables for the noncommercial treatment optimization:

- sudden aspen decline (SAD) presence
- fire risk in the WUI
- Gunnison sage-grouse habitat

Each of these variables was represented in a raster with a cell size of 30 m. Variables were scored from 0 to 4, with higher numbers representing values that were more desirable for non-commercial treatment. The total score was a sum of all input variables, weighted as follows: SAD presence (0.6), WUI risk (0.3), and Gunnison sage-grouse habitat (0.1). (***Table 6, Step 2b Maps***)

Step 3: Determine input data for variables and derive scores

WUI Risk and Gunnison sage-grouse critical habitat score derivations were identical to those for the commercial treatment optimization. SAD presence was scored based on an Aerial Detection Survey classification of sudden aspen decline from 2000 – 2014. Areas with sudden aspen decline were scored as 4, and all other areas were scored as 0. Area breakdowns for non-commercial analysis input scores by forest type can be found in Table 6.

Total score

Individual scores for each attribute were combined in a weighted sum to obtain a final score as follows:

$$(0.6) \times SAD\ score + (0.3) \times WUI\ score\ +\ (0.1) \times\ Gunnison\ sage\ grouse\ score\ =\ Total\ score$$

Total scores ranged from 0 to 3.7 (***Table 7, Map 3b***).

Step 4: Identify first cut priority treatment areas

We considered all non-commercial spruce-aspen and aspen mix forest with a score ≥ 0.9 (112,753 ac) to be optimal for non-commercial treatment, as well as all commercial aspen areas with a commercial score ≥ 1.6 (63,325 acres), for a total of 176,078 acres. As discussed in the commercial analysis section above,

[1] Suitable/commercial aspen mix was excluded from final steps of the commercial optimization analysis; absent an existing aspen market, all commercial treatments are expected to be in spruce forests. However, suitable/commercial aspen areas were grouped with the noncommercial clusters of high-scoring aspen, as detailed in the noncommercial analysis steps. Absent a commercial market for suitable aspen, the Forest still intends to noncommercially treat such where doing so would meet project objectives.

high-scoring suitable/commercial aspen was included because the current lack of a commercial market for aspen means it will most likely be subject to non-commercial treatment; these areas needed to be considered for logical broadcast burn boundaries in Step 4. ***Tables 8 and 9*** show the percentages of individual attribute scores for non-commercial and suitable/commercial aspen forest that were included in this area. The noncommercial threshold was selected in order to identify approximately 2x the extent of area that SBEADMR proposes to noncommercially treat (60,000 acres); the suitable/commercial threshold is the same as that selected for the spruce and spruce-mix in the commercial analysis, above.

Within the 176,078 higher-scoring acres, we then incorporated additional operational criteria in order to ensure identified areas were clustered closely enough to constitute viable treatments: ≥ 250 acres of priority areas within 1 mile of each other (***Map 4***). This step resulted in a total acreage of 130,188 acres of aspen and aspen mix.

Step 5: Validate final priority treatment areas

The GMUG district personnel then reviewed the first cut priority treatment areas for further fine-tuning and validation based upon the following criteria:

- The need for regeneration of aspen, primarily for long-term wildlife habitat needs but also to improve the age-class diversity of aspen on the landscape.
- The opportunity to, and efficacy of, reducing or modifying fuels near infrastructure/subdivisions/etc., to protect those values from future wildfires.
- The need to include logical control lines for prescribed burning around each treatment area, ie, most polygons were 'expanded' to include roads, drainages, ridgetops or other potential control lines so that prescribed burning could be effectively and safely utilized to manage the target vegetation types. (By necessity this process included some adjacent, non-aspen, non-spruce/fir vegetation types to take advantage of the control features on the landscape).
- Strategic placement of treatment areas to assist with managing future natural ignitions as natural processes (ie, benefits) across the landscape.

In the end, 58 polygons were identified for non-commercial treatment for a total of 145,429 acres (***Table 10, Map 5b***), of which 60,000 acres are intended to be treated over the duration of SBEADMR's implementation. Of the 58 polygons, 31 polygons totaling 920 acres were identified on the Paonia Ranger District; these polygons were previously identified as priority treatment areas by the district biologist in cooperation with Colorado Parks and Wildlife. All polygons were also named for tracking purposes.

Step 6: Clean GIS & Identify Target Vegetation

Due to discrepancies between GIS layers used in the prioritization process, i.e., differences in the Forest Service boundary between layers, the final PTAs were "cleaned" to remove the resulting slivers. Furthermore, insignificant slivers of PTAs that spilled across watershed boundaries were cleaned (less than 1 acre). Cleaning slivers resulted in 145,055 acres.

Finally, specific habitat and vegetation types, though depicted in the maps of the overall area, were identified in order to analyze only those acres that would be treated. For example, treatments would be avoided in designated critical habitat for Gunnison Sage-grouse, unless such habitat consisted of forest vegetation cover. Furthermore, most/all vegetation cover types that would not be targeted for burning (such as willow, lodgepole pine, etc) were excluded, such that these other types would only be treated incidentally to the target cover types (aspen and aspen-spruce mix). "Other" vegetation in the noncommercial PTAs, including spruce, accounted for 67,809 acres. Only 10% of these acres were carried forward for analysis as incidentally treated.

After cleaning and accounting for the exclusion of specific habitats and vegetation cover types, the total noncommercial PTA acres encompassed 77,246 acres.

Table 1. Classification of past treatments for commercial optimization

Removed from further consideration in SBEADMR	Overstory removal cut
	Patch clearcut
	Permanent land clearing
	Seed-tree cut
	Stand clearcut
	Shelterwood removal cut
	Coppice cut after 1990 in aspen with no spruce
Included for further consideration in SBEADMR	Commercial thin
	Group selection cut
	Improvement cut
	Single-tree selection Cut
	Thinning for hazardous fuels reduction
	Underburn - low intensity
	Chipping of fuels
	Compacting/crushing of fuels
	Sanitation cut
	Pre-1997 salvage cuts
Included for further consideration in SBEADMR; flagged	Fuel break
	Shelterwood cut
	Wildlife habitat mechanical treatment
	Wildlife habitat regeneration cut
	Salvage cuts from 2003-2014
	Broadcast burning
	Coppice cuts in spruce-aspen

Table 2. Fire risk in the WUI score components and classification

Values		**Hazards**	
WUI type	Score	*Fuels*	Score
RAWS site	1	Aspen mix	2
Communication site	3	Spruce – aspen	3
Developed recreation site	3	Spruce mix	4
Utility corridor	3		
Urban interface	1 – 4	*Slope*	
		0 – 8%	1
		9 – 20%	2
Urban interface parcel density classification (# parcels within 1 mile)		21 – 30%	3
		>30%	4
<3 parcels	1		
3 – 5 parcels	2	*Aspect*	
6 – 10 parcels	3	0 – 90^{o}	1
11+ parcels	4	270 – 360^{o}	1
		90 – 165^{o}	2
		165 – 170^{o}	3
		240 – 270^{o}	3
		170 – 240^{o}	4

1 = low fire risk, 2 = medium fire risk, 3 = high fire risk, 4 = very high fire risk

Total WUI risk score
=(0.5)*Values+(0.3)*Fuels+(0.1)*Slope+(0.1)*Aspect

Table 3. Areas by forest type for optimization variables and scores – commercial analysis.

		Area (acres)			
Variable	Score	Spruce mix	Spruce-Aspen	Aspen mix	All forest
Distance to road					
> 1 mi	0	2,364	1,620	4,593	8,576
0.25 – 1 mi	2	42,580	37,335	53,566	133,481
<0.25 mi	4	70,371	49,997	60,234	180,603
Fire risk in the WUI					
Non-WUI	0	79,534	53,738	49,789	183,061
1 – Low risk	1	0	0	6,024	6,024
2 – Moderate risk	2	8,474	11,789	40,920	61,182
3 – High risk	3	21,788	23,238	21,660	66,686
4 – Very high risk	4	5,519	188	0	5,707
Drainage density					
4.94 – 10.77 mi/sqmi	0	2,553	3,075	5,865	11,494
3.56 – 4.93 mi/sqmi	1	17,463	13,561	23,614	54,638
2.50 – 3.55 mi/sqmi	2	33,108	26,747	36,089	95,944
1.44 – 2.49 mi/sqmi	3	37,072	29,827	34,397	101,295
0 – 1.44 mi/sqmi	4	25,119	15,742	18,428	59,289
Lynx use					
Lynx high use area	-4	5,659	336	41	6,036
Not lynx high use	0	109,657	88,616	118,352	316,624
Gunnison sage-grouse habitat					
Not GuSG habitat	0	115,069	88,121	112,968	316,158
GuSG habitat	4	246	831	5,424	6,502

Table 4. Area by forest type for total scores, commercial analysis.

	Area (acres)				
Total Score	Spruce mix	Spruce-Aspen	Aspen mix	All forest	Cumulative area
3.10	8	6	57	71	71
3.00	276	1	0	277	348
2.95	11	7	215	234	581
2.85	927	13	0	940	1,522
2.80	18	27	451	495	2,017
2.70	3,301	1,911	1,165	6,378	8,395
2.65	17	75	641	733	9,128
2.55	4,293	4,762	2,708	11,766	20,894
2.50	33	252	807	1,093	21,987
2.40	5,330	5,364	5,898	16,596	38,583
2.35	28	164	385	578	39,160
2.25	4,635	4,150	7,752	16,541	55,701
2.20	22	2	322	347	56,048
2.10	4,685	3,388	7,774	15,850	71,898
2.05	5	10	524	539	72,438
1.95	2,686	3,281	7,632	13,602	86,040
1.90	22	20	619	662	86,701
1.80	13,989	9,695	11,873	35,566	122,267
1.75	51	118	647	817	123,084
1.65	19,264	14,093	15,483	48,852	171,936
1.60	3	95	355	452	172,388
1.50	14,349	11,428	13,689	39,476	211,865
1.45	9	5	231	245	212,109
1.35	6,573	5,469	9,060	21,107	233,216
1.30	3	44	129	177	233,393
1.20	7,920	4,526	7,505	19,956	253,349
1.15	16	7	40	62	253,411
1.05	10,019	6,838	8,571	25,435	278,846
1.00	0	0	0	1	278,847
0.90	8,519	8,219	8,157	24,901	303,748
0.75	4,905	4,269	3,511	12,687	316,435
0.60	1,463	433	939	2,835	319,270
0.45	488	55	351	895	320,165
0.30	803	154	458	1,415	321,580
0.15	608	71	259	939	322,519
0.00	36	2	183	221	322,740

Dashed line indicates score threshold for inclusion in subsequent steps; scores above line included.

Table 5. Percentage of total score by individual component scores, commercial analysis (spruce mix and spruce-aspen only)

		Percentage of total score range area by variable/attribute score																
		Distance to Road			WUI Risk					Drainage Density					Lynx use		Gunnison sage-grouse habitat	
Score Range	Area (ac)	**0**	**2**	**4**	**0**	**1**	**2**	**3**	**4**	**0**	**1**	**2**	**3**	**4**	**-4**	**0**	**0**	**4**
3 – 3.1	291	0	0	100	0	0	0	5	95	0	0	0	0	100	0	100	95	5
2.5 – 2.95	15,646	0	1	99	0	0	1	78	20	0	5	12	60	24	0	100	97	3
2.0 – 2.4	27,783	0	19	81	0	0	35	59	6	4	15	37	18	26	1	99	99	1
1.5 – 1.95	89,094	1	23	76	73	0	10	17	1	2	5	33	39	21	2	98	100	0
1.0 – 1.4	41,428	2	67	30	92	0	4	4	0	5	28	1	42	24	4	96	100	0
0.5 - 0.9	27,807	4	91	5	99	0	1	0	0	4	33	60	0	3	6	94	100	0
0 - 0.45	2,218	65	35	0	100	0	0	0	0	2	31	43	25	0	35	65	100	0

Dashed line indicates score threshold for inclusion in subsequent prioritization steps. Scores above the line were included.

Table 6. Areas by forest type for variable/attribute values and scores - non-commercial analysis

		Area (acres)		
Attribute	Score	Spruce-aspen	Aspen mix	All forest
Sudden aspen decline				
No SAD	0	74,009	136,743	210,753
SAD	4	9,040	32,412	41,452
Fire risk in the WUI				
Non-WUI	0	37,700	65,815	103,515
1	1	0	5,110	5,110
2	2	13,663	51,983	65,646
3	3	30,071	46,247	76,318
4	4	1,615	0	1,615
Gunnison sage-grouse habitat				
Not GUSG habitat	0	81,761	154,385	236,146
GUSG habitat	4	1,289	14,770	16,059

Table 7. Area by forest type for total scores, non-commercial analysis

	Area (acres)			
Total Score	Spruce-Aspen	Aspen mix	All forest	Cumulative area
3.7	36	743	779	779
3.6	284	0	284	1,063
3.4	118	2,495	2,613	3,677
3.3	3,802	6,615	10,419	14,096
3.1	0	125	125	14,221
3	1,526	9,795	11,324	25,545
2.8	71	762	833	26,378
2.7	0	1,114	1,114	27,493
2.4	3,203	10,763	13,970	41,463
1.6	1	2,499	1	41,464
1.3	270	0	2,770	44,233
1.2	1,330	4,629	1,331	45,564
1	191	0	4,820	50,384
0.9	25,962	36,391	62,368	112,753
0.7	0	598	598	113,351
0.6	11,829	35,064	46,904	160,255
0.4	0	2,920	3,522	163,778
0.3	602	3,273	3,274	167,051
0	33,824	51,371	85,216	252,267

Dashed line indicates score threshold for inclusion in subsequent prioritization steps. Scores above the line were included.

Table 8. Percentage of total score by area of individual variable/attribute scores - Non-commercial analysis, non-commercial spruce-aspen and aspen.

		Percentage of total score area by variable/attribute scores								
		Sudden aspen decline		WUI Risk					Gunnison sage grouse habitat	
Score Range	Area (ac)	**0**	**4**	**0**	**1**	**2**	**3**	**4**	**0**	**4**
3.5 - 3.7	1,063	0	100	0	0	0	73	27	27	73
3.0 - 3.4	24,482	0	100	0	1	57	43	0	89	11
2.5 - 2.9	1,947	0	100	43	57	0	0	0	57	43
2.0 - 2.4	13,970	0	100	100	0	0	0	0	100	0
1.5 - 1.9	1	100	0	0	0	0	0	100	0	100
0.9 - 1.4	71,289	100	0	0	0	7	91	2	89	11
0.5 - 0.8	47,502	100	0	0	1	99	0	0	99	1
0 - 0.4	92,012	100	0	96	4	0	0	0	96	4

Dashed line indicates score threshold for inclusion in subsequent prioritization steps. Scores above the line were included.

Table 9. Percentage of total score by individual component scores, non-commercial analysis, suitable timber/commercial aspen mix forest

		Percentage of total score area by variable/attribute scores																
		Distance to Road			WUI Risk					Drainage Density					Lynx use		Gunnison sage-grouse habitat	
Score Range	Area (ac)	**0**	**2**	**4**	**0**	**1**	**2**	**3**	**4**	**0**	**1**	**2**	**3**	**4**	**-4**	**0**	**0**	**4**
3 - 3.1	57	0	0	100	0	0	0	100	0	0	0	0	0	100	0	100	0	100
2.5 - 2.95	5,988	0	1	99	0	0	22	78	0	0	3	16	56	24	0	100	65	35
2.0 - 2.4	22,655	0	10	90	1	2	59	39	0	3	14	40	24	19	0	100	95	5
1.6 - 1.95	36,609	0	41	59	38	5	38	19	0	5	20	10	45	20	0	100	96	4
1.0 - 1.5	39,227	4	64	31	60	8	30	2	0	6	24	35	22	13	0	100	99	1
0.5 - 0.9	12,607	13	86	0	89	3	8	0	0	5	27	63	1	3	0	100	100	0
0 - 0.45	1,250	100	0	0	98	2	0	0	0	15	23	37	26	0	0	100	100	0

Dashed line indicates score threshold for inclusion in subsequent prioritization steps. Scores above the line were included.

Table 10. Areas by total score included in treatment polygons

Commercial Treatments Spruce and Spruce-aspen		Non-commercial treatments			
		Suitable timber/commercial aspen mix		Non-commercial aspen mix and spruce-aspen	
Total Score	Area (ac)	Total Score	Area (ac)	Total Score	Area (ac)
3	230	3.1	8	3.7	395
2.85	604	2.95	3	3.6	87
2.8	9	2.8	24	3.4	1,268
2.7	3,415	2.7	681	3.3	3,298
2.65	55	2.65	110	3.1	50
2.55	6,990	2.55	1,073	3	3,886
2.5	35	2.5	180	2.8	98
2.4	7,163	2.4	2,466	2.7	266
2.35	24	2.35	73	2.4	1,913
2.25	5,513	2.25	2,880	1.3	1,049
2.1	4,918	2.2	27	1.2	15
1.95	3,817	2.1	3.024	1	1,234
1.8	18,341	2.05	48	0.9	12,130
1.75	2	1.95	2.772	0.7	51
1.65	22,065	1.9	144	0.6	7,006
1.5	15,118	1.8	4.45	0.4	253
1.35	4,493	1.75	29	0.3	459
1.2	4,802	1.65	4,101	0	8,061
1.05	6,401	1.6	24		
0.9	4,920	1.5	3,184		
0.75	1,418	1.35	2,327		
0.6	262	1.3	23		
0.45	119	1.2	1,708		
0.3	45	1.15	4		
0.15	10	1.05	1,322		
		0.9	828		
		0.75	524		
		0.6	160		
		0.45	17		